Accessible user profile modeling for academic services based on MOOCs

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ABSTRACT
MOOCs are examples of the evolution of eLearning environments, it is a fact that the flexibility of the learning services allows students to learn at their own time, place and pace, enhances continuous communication and interaction between all participants in knowledge and community building, benefits people with disabilities and therefore can improve their level of employability and social inclusion. MOOCs are leading a revolutionary computer and mobile-based scenario along with social technologies that will emergence new kinds of learning applications that enhance communication and collaboration processes, for that reason a strategy of the use of metadata regarding the achievement of accessibility from content to user preferences is presented in this paper, in order to achieve a better accessibility level while designing new learning services for people with functional diversity based upon MOOCs.

Categories and Subject Descriptors
H.1.2 [**Information Systems**]: User/Machine Systems - *human factors, human information processing.* H.5.2 [**Information Interfaces and Presentation**]: User Interfaces - s*tandardization, prototyping*, *user-centered design.* K.3.1 [**Computers and Education**]: **Computer Uses in Education** - *Collaborative learning***,** *Distance learning.* K 4.2 [**Computers and Society Issues**]: Social Uses - a*ssistive technologies for persons with disabilities, handicapped persons/special needs*

General Terms
Design, Human Factors, Standardization.

Keywords
Accessibility, MOOC, standards, metadata, user profiling.

1. INTRODUCTION
Massive Open Online Courses (MOOCs) have made open education available to the public domain by offering a free window to their courseware that students might experience in university and colleges. Higher Education institutions are shifting from closed educational platforms to new open learning environments by demonstrating that the evolution of open education on the Internet is enabling thousands of people around the world to follow different educational initiatives [1], [2].

The possibilities that ICT offer people with visual, auditory and mobility disabilities; in order to improve their well-being, promote their training and therefore their potential for entering the workforce [3], [4]. A strategy to make MOOCs courses more accessible is working with accessibility standards actively using metadata from the user's point of view and from the point of view of the educational resources themselves, this theoretical work presented in the following article offers major opportunities of modeling user profiles within accessibility metadata standards to access the educational resources in the best way to suit their preferences, being the objective of this work to design a system for recommending MOOCs adapted to the user needs in order to achieve new professional competences and adapted to the learner's preferences, first the case study of accessibility in MOOCs is explained, after the different standards are presented, thirdly metadata necessary for MOOCS is shown and finally we have the main conclusions.

2. ACCESSIBILITY ISSUES IN MOOCS
MOOC platforms are web based eLearning engines that provide mechanisms for scheduling academic curriculum, allow synchronous and asynchronous communication between instructors and students and delivering various modes of assessment. Learners with disabilities using assistive technologies can benefit greatly from eLearning and MOOCs, not just because it allows distance and flexible learning activities, but also because it helps students with disabilities to access resources which would otherwise present significant barriers to them. These barriers can include the interface elements of the eLearning platform in which materials and objects reside, and the manner in which users interact with these objects [5].

An effective eLearning environment should take into account each learner's abilities, together with learning goals, where learning takes place, and which specific devices the learner uses. In this context, it is strategic to describe learner's preferences and needs by means of a profile. How this profile interacts with the eLearning platform interface and the objects it contains can impact upon the learning experience of users with different capabilities, as it is done in the project EU4ALL [6]. With all these standards, learners can specify which kind of adapted and\or alternative resource they prefer or need. For instance, text may be

preferred over visual resources or audio might be preferred over text or images, etc.

3. ACCESSIBILITY STANDARDS: LEARNING PROFILING AND LEARNING RESOURCES

Several strategies can be applied to improve the accessibility level in MOOC platforms and services as a whole, some of them are related to add accessibility to MOOC content repositories of learning materials via specific metadata schema and defining the user profile and preferences [7]. We have to distinguish between two types of standards, those used from the user's point of view to define their profile having their preferences and those devoted to the educational resources so that they fit the user's needs, this is made with learning profiling standards and learning resources standards (Figure 1).

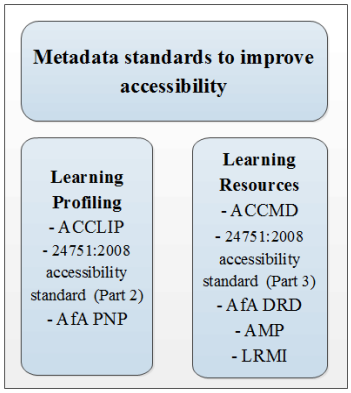

Figure 1. Metadata standards to improve accessibility.

4. ACCESSIBILITY STANDARDS AND MOOCS

To define and model the user profile we focus on the most recent and most comprehensive IMS standards relatives to Access for All (Afa) and its aspects PNP and DRD, because they allow us to define collections rather than a single value for each case (multiplicity) [8].

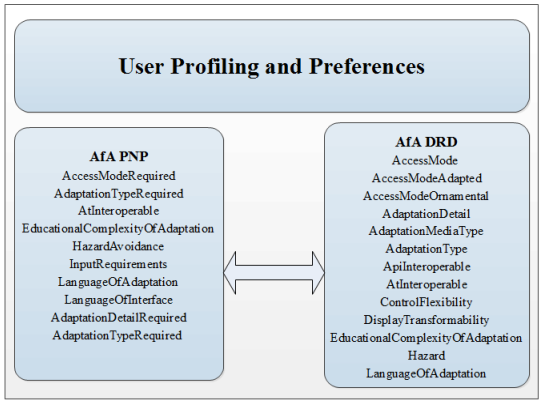

Figure 2. Access for All user profile and preferences.

We have chosen ten from sixteen elements that have to do with the educational aspects of the profile and thirteen from nineteen elements relating to the educational aspects of the resource. The chosen criteria have been those related with the access mode requested by the user, the type of adaptation needed, those that have information related on the educational resource and finally those related to language. The selection takes into account the design of the recommender system (Figure 2).

5. CONCLUSIONS

It is necessary to describe learner's preferences and needs by means of a profile and how this profile interacts with the eLearning platform interface, also the resources it contains will affect the learning experience of users with different capabilities. Access for All (Afa) in its PNP and DRD standards offer the possibility to learners so they can specify which kind of adapted and\or alternative resource they prefer or need. In designing the recommender system the following step is to refine the user profile modeling.

6. ACKNOWLEDGMENTS

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7. REFERENCES

[1] Haggard, S. 2013. Massive open online courses and online distance learning: review. GOV.UK Research and analysis.

[2] Gaebler, M. 2014. MOOCs Massive open online courses. *EUA occasional papers*. EUA European University Asociation.

[3] i Díaz, M. P. and Bonjoch, M. R. 2007. ¿Y después del trabajo, qué?: más allá de la integración laboral de las personas con discapacidad. *Revista de Educación*, (342), 329-348.

[4] Vila, M., Pallisera, M. and Fullan, J. 2007. Work integration of people with disabilities in the regular labour market: What can we do to improve these processes. *Journal of Intellectual & Developmental Disability*, Volume 32, Issue 1:10-18.

[5] Iglesias, A., Moreno, L., Martínez, P., y Calvo, R. 2011. Evaluating the accessibility of three open-source learning content management systems: A comparative study. Computer Applications in Engineering Education, 22 (2), 320-328.

[6] Boticario, J.G., Rodriguez-Ascaso, A., Santos, O.C., Raffenn,e E., Montandon, L, Roldán, D, Buendía, F. 2012. Accessible Lifelong Learning at Higher Education: Outcomes and Lessons Learned at two Different Pilot Sites in the EU4ALL Project. *Journal of Universal Computer Science*, vol. 18, no. 1 (2012), 62-85.

[7] Sanchez-Gordon, S., Luján-Mora, S. 2015. Adaptive Content Presentation Extension for Open edX. Enhancing MOOCs Accessibility for Users with Disabilities. ACHI 2015: *The Eighth International Conference on Advances in Computer-Human Interactions*. IARIA, 2015. ISBN: 978-1-61208-382-7

[8] Centelles Velilla M., Vázquez Guzmán C., Ribera M. and Pérez Pineda I. 2014. Asignación de metadatos de accesibilidad a vídeos docentes, INNOVADOC (Documents d'Innovació Docent).